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THE CARE AND TREATMENT OF EPILEPTICS*

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THE term "epilepsy" refers to a group of symptoms which are the clinical expression of various underlying conditions; *e. g.*, structural stigmata of defectiveness; degenerative cardio-vascular disease; focal organic disease of the brain; toxic states and those arising without any tangible cause; *i. e.*, the idiopathic epilepsies.

The syndrome may be defined as a chronic, progressive disorder, with a symptom complex, characterized by recurrent abrupt seizures of impairment or loss of consciousness, with or without convulsions and usually producing mental and oftentimes physical deterioration.

The time allowed me is too brief to refer at length to diagnosis, but I wish to call attention to the fact that frequently the early manifestations remain unrecognized for years. The various types of mild and incomplete seizures are too commonly ascribed to other causes. The borderland cases require long and careful observation before a definite diagnosis can be arrived at.

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The etiology of epilepsy is apparently as complex as its phenomena. The difficulty in obtaining correct information from relatives or friends in regard to alcoholism, syphilis, insanity and similar conditions is marked and oftentimes well nigh impossible. They feel that some of these matters should be concealed from everyone, even the physician. In many cases, there is, of course, a complete or practically complete ignorance of facts concerning the exact state of health of living members and the cause of death of those not living. The family physician is sometimes guilty of either aiding the family in concealing some important information, or he is careless in pressing sufficiently hard to obtain the requisite facts which have a bearing on the case in question. He is sometimes afraid to offend the relatives by asking for such information. If he uses proper tact and judgment, he can in practically every case, secure from the relatives all of the information within their knowledge regarding the case. This total information is in many patients painfully meagre and sometimes even nil.

The consensus of opinion at the present time is that true epilepsy is indicative of a family neuropathic degeneration. There are often present other hereditary degenerative conditions such as stammering, backwardness in walking and talking, delayed dentition, deafmutism, imbecility, etc.

Eighty-five per cent. of all cases appear before the twentieth year of age, thus showing itself as essentially a malady of the period of development and growth of the central nervous system. It is during these years that the nervous instability acquired by heredity is most

effective; and it is during this period of life that causes altogether insignificant, or insufficient in stable nervous systems, may light up the tendency to the impairment of consciousness with the convulsions, which characterize this malady. Many explanations are given by the patient or his friends or relatives as to the cause of onset, but these in most cases, are but conjectural. The essential cause and real explanation is thought to be found in the rapid growth during the first few years of life, the onset of puberty and accompanying changes in persons predisposed by heredity to nervous instability and convulsions.

In these individuals a convulsive habit may be established either in course of natural development, or as a result of certain occasional or accidental causes. Once the convulsive habit has been established, there is a tendency to its perpetuation in the form of recurring epileptic seizures. Thus infantile convulsions are frequently the starting point of a subsequent epilepsy, either as a direct sequence of the convulsions, or in later years at or about the onset of puberty. The great majority of the cases of infantile cerebral palsy have convulsions in later life. Convulsions occurring as a result of the exanthemata, acute infective disorders and disorders due to toxic influences are often to be regarded as manifestations of an acute epilepsy.

Convulsions arising as a result of trauma to the head, without organic disease of the brain, are of a similar character, but less acute in onset. The convulsions induced by traumatic lesions of the brain, by coarse lesions of a vascular, more especially syphilitic, nature and those of organic cerebro-cortical disease, particularly tumor, may

be forerunners of genuine epileptic seizures, which persist even after the exciting cause has been medicinally or surgically removed.

The convulsions of later life, as are seen in the so-called "senile epilepsy," and in those associated with cerebral thrombosis or hemorrhage, are thought to point to the existence of a latent convulsive tendency, which is only brought into prominence by an accidental circumstance, or constitutional cause.

Those individuals who become epileptic do so, in all probability, because of some primary defect in development of the brain which renders the cortical cells so unstable that they re-act abnormally to various stimuli. As time goes on, this instability becomes more marked in consequence of structural changes imposed upon the primary defect.

Regarding the use of alcohol, it is not the quantity of alcohol ingested that is important, but it is the reaction of the individual case to the alcohol ingested. One person might consume large quantities and suffer less damage than another taking a much smaller quantity of a milder intoxicant. Each case is a study in itself when the question of transmitted weakness as a result of alcohol is to be considered.

In very few cases of epilepsy seen in our public institutions, can we obtain a history of specific disease in the parent, nor can we find in the patient manifestations of hereditary taint. Most authorities have claimed that the percentage of cases due to hereditary syphilis is small.

The rôle played by hereditary syphilis in the production of epilepsy is difficult to ascertain definitely. With the Wassermann and Noguchi

tests more evidence has been uncovered to prove that syphilis is present in a considerable percentage of our defective classes, among whom, of course, are included epileptics. So many pregnancies in syphilitic mothers fail to come to term or if the child is born, have but a brief existence, that we would not expect to find this underlying factor in the majority of older defectives.

Hochsinger, investigating the fate of children whose parents had contracted syphilis before marriage (J. A. M. A., Vol. 55, p. 610), studied 139 families of the better class with 569 children. These 139 women had 263 syphilitic infants born alive, 253 dead babies and 53 living non-syphilitic children. Of the 263 affected children, 55 died before reaching four years, thus leaving 208 under prolonged observation. Hospital statistics show that 70 per cent. of all syphilitic babies die in their first year. Hochsinger claims the first born child is most affected, the second less, and so on. Where maternal lues was present, the children were more liable to be affected. He feels that an energetic, long-continued anti-syphilitic treatment may do much good for these children.

As stated, we do occasionally find that in acquired syphilis, phenomena present themselves which cause the physician to diagnose epilepsy. Anti-syphilitic medication, in some cases, produces excellent results; in others its effect is nil.

The conclusions to be drawn from our present knowledge of the possible influence of etiological factors in epilepsy are as follows:

1. Epilepsy, feeble-mindedness, insanity, alcoholism and similar disorders, when present in antecedents have a deleterious influence on a

large percentage of descendants, especially when in the direct line.

2. The deleterious influence manifests itself either by mental deficiency, physical abnormality or as one of the symptom complexes as epilepsy, insanity, etc.

3. Uniform and exhaustive methods of studying heredity along lines now being mapped out must be obtained before our statistics will be of great value.

4. The destructive influence of alcohol, syphilis, the various infectious diseases, rickets, trauma, etc., on the central nervous system is unquestioned. These pave the way for epilepsy in the individual himself as well as in his progeny.

5. The epilepsies are as a rule but evidence of a subnormal individual.

The present opinion as regards our knowledge of epilepsy, is that there are no definite facts as to its exact cause, but at the same time, among those who have carefully studied the matter, there is quite a general consensus of opinion that the symptom complex is of toxic or autotoxic origin. The analogy of the cell changes in epilepsy to those produced by the toxic agents lends much force to this opinion.

As to the pathology of epilepsy, we must in a large part agree with Reynolds, who wrote in the early sixties, that pathological anatomy has shown three things; first, that there is scarcely any morbid condition which may not be found sometimes in the bodies of epileptics, second, that no structural change is constantly found at all periods of the disease, third, that some lesions are of more common occurrence than others and that many lesions have no causal relation to the

phenomena of epilepsy and that many of these lesions must be duly regarded as its effects.

Hughlings Jackson's theory is that epilepsy is more often due to a condition of specific systemic poisoning, a condition in which deep-seated errors exist in the fundamental principles of metabolism, in the ultimate cell life; and which errors are so serious from time to time and at irregular intervals that a positive universal condition is the result, which toxic condition varies in intensity in the same individual at different times, as it must to produce attacks of epilepsy alternately so unlike and so varied in character.

Many claim that epilepsy is due to some toxic substances circulating in the blood. Inasmuch as seizures similar to those observed in epilepsy are seen in diabetes, uremia, various infectious disorders, alcoholism and other conditions, these claims have much weight. The toxic substances may be of intestinal origin as result of abnormal digestion or absorption; of impaired excretion; changed internal secretion or from external origin such as from alcohol. The toxic substances reported may cause the seizures, but there must have been a predisposition in the individual as we all, without doubt, have at one time or another similar substances circulating in our blood.

However prominent the exciting cause may seem in some cases, the predisposition present is practically always very plain if a careful study of the case is made.

Although the general medical profession still believe in numerous reflex epilepsies, most of these observers who have had large experience feel with Gowers, Peterson and others, that the so-called reflex epilepsies are exceedingly rare.

Although these conditions may be corrected, one seldom sees a complete cessation of seizures and in many, no appreciable effect is noted. An epileptic has a nervous system more susceptible to influences than has a normal individual, but that such reflex causes can produce the disease in an otherwise healthy person, I do not believe. The hereditary instability of the cerebral cortex is the ever present condition we must consider. More and more cases of so-called idiopathic epilepsy are shown to have an organic basis.

The chemical changes occurring in the living nerve cell are unknown quantities and it seems reasonable to believe that the exact exciting cause of the development of the symptoms of epilepsy, insanity, etc., is locked within these cell limits beyond discovery by any methods now known to us, and perhaps, as has been maintained, may never be known.

As referred to, the various forms of meningitis, cysts, new growths, localized hemorrhage, aneurism, encephalitis and depressed bone are possible causes of epilepsy.

Surgical removal of these lesions when possible may relieve but too often we find the seizures recur. If a portion of the cortex or a part which presses on the cortex is removed, we must necessarily have subsequent cicatrization or other changes as a result of which a focus of irritation is developed to continue the symptoms we had hoped to have disappear. The removal of a myxoma, glioma or other new growth of the cortex may be perfect from a surgical standpoint and still the symptoms of the epilepsy reappear within a few months or sooner. Certain alterations of the finer structures of the contiguous

parts have occurred which are beyond remedy by use of the knife. Some temporary relief, really marked in some cases, does occur.

As L. Pierce Clark pointed out, the aura, except when motor in character, is entirely subjective and to interpret its possible localizing value, all the fallacies of human testimony have to be reckoned with in estimating the statements of an individual who is in the majority of instances defective mentally.

Trephining for the relief of epilepsy is of ancient origin, when it was supposed to permit the evil spirit to escape. It was used extensively during the sixteenth century.

The treatment of epilepsy from the most remote period has included surgical procedures, regarding the efficacy of which there has always been much dispute. One writer of considerable note states that after a most exhaustive study of surgical treatment of essential epilepsy, he concludes that operation is useless. Neither sympathectomy nor craniotomy is capable of insuring a lasting improvement or permanent cure.

How many persons suffer trauma of head and elsewhere and never develop epilepsy? The trauma in the history of the epileptic are simply incidental in many instances. Manley reported that in a series of more than seven hundred fractures of the skull, he found no direct evidence that epilepsy occurred in any one who before injury did not give a history of having had symptoms earlier in life.

Kocher claims that epilepsy is due to a general or a local exaggeration of the intra-cranial pressure. Opening the dura acts as a safety valve to regulate this pressure and results in cure in many

cases. Bergmann claims epilepsy is hereditary in 90 per cent. of the cases, and whether congenital or acquired, bars a successful operation.

Alexander, of Liverpool, advocates fenestration of the dura as a method of relief.

Many observers maintain that there exists a strong relationship between all epilepsies and the various paralytic states of the brain, indeed Freud states that all epilepsies are apoplectic in origin, either intra or extra uterine. In partial support of this, we must admit that many epileptics fail on superficial examination to present brain palsies, but a careful search many times reveals evidences of an unrecognized cerebral palsy probably dating back to infancy.

Sir Victor Horsley reports operating on five cases of idiopathic epilepsy of localized onset. Two of the cases had proved to be of organic origin. These showed to him that an exploratory operation might be justifiable in cases which had resisted medical measures. In Jacksonian epilepsy there exists a gross lesion or a toxæmia. In traumatic cases of a Jacksonian type, the convulsions may be generalized or localized. Surgical measures are not by any means uniformly successful; in localized cases, however, trephining is, according to Horsley, very successful, particularly when the scar was in a so-called motor area; less successful when the scar is in the occipital region, and still less successful when it is in the frontal or temporo-sphenoidal region.

It should be borne in mind that neoplasms within the cranium may not produce localizing convulsions but cause general convulsions similar to those seen in idiopathic epilepsy. Cushing tells us that an inversion of color fields may be the first symptom of brain tumor.

My opinion is that brain tumor and traumatic cases of epilepsy operated on early before several seizures have occurred to produce permanent damage, may be benefited in many instances. Careful after treatment with sedation where indicated is of the utmost importance.

We must remember that any change in treatment, operative or not, often produces much benefit either as a result of closer attention to details or by psychical influence. Do not forget that many patients are worse after trephining than they were before.

Alexander, and later Jonnesco and many others, have practiced cervical sympathectomy in epileptics with reports of a percentage of cures reaching from 25 to 50 per cent. Jabculay and Lannois report a series of sixteen cases in which the result as far as cure was nil. I witnessed three operations of this nature performed at the Craig Colony by Dr. Roswell Park, of Buffalo, N. Y. One, a male, had grand mal seizures two or three times a month preceding the operation. Since then a period of six years has elapsed with a freedom from seizures. He is now practicing law in Cincinnati. The second, a female, had her seizures much less frequently for a time. The third case, a female, showed no improvement.

The epileptic is too frequently a degenerate with an abnormal nervous system which cannot be readjusted and made anew by operative procedure. The congenital defect is beyond renovation by surgical skill.

The question of exhaustion palsies occurring in epilepsy may be due to a similar cause which produces the temporary palsies seen in uremia, that is arterial spasm and localized cerebral edema. Cushing and Bordley, as a result of

their observations on their cases of cerebral decompression, came to the conclusion that the local and transient hemiplegias and aphasias, amauroses and Jacksonian fits or uremia are also due to edema of the brain. What can operative intervention do for these?

The etiological influence of the pelvic organs of the female in the production of the phenomena of epilepsy has been argued pro and con for many years. In my opinion, as a consequence of failure to find the alleged close relationship between these conditions, we must seriously question the advisability of performing operations on the female generative organs with the idea in mind of gaining anything unless it be an improvement of the general health of the individual by removing some pathological condition.

La Place and Runyon have reported epileptics markedly relieved as a result of appendicostomy with subsequent colonic irrigations over an extended period.

Sieveking, writing some sixty years ago on epilepsy, stated with much wisdom that: "The air the patient breathes, the water he drinks, and his ablutions, his daily occupation and habits, his amusements, his food and beverage, his clothing, his mental and moral history, and his prospects in life, should be inquired into in order to determine whether, or in how far, one or more of those elements require modification."

These matters have in our day too often been neglected by the physician. All abnormal conditions of the nose, eye, teeth, gastro-intestinal tract, pelvic organs in women, etc., must be corrected if possible as a basis for correct treatment. In order that proper dietetic and hygienic treat-

ment be carried out, the epileptic should be placed in a special institution if a properly trained and capable nurse or companion cannot be secured outside.

A regular occupation, preferably out of doors, is very essential for the able-bodied epileptic. Special instruction in the ordinary school branches and especially in manual training, should be arranged for the younger patients. This is important to inculcate discipline as well as for the knowledge acquired.

There is no specific medication to be used in epilepsy, although we must admit that proper use of the bromine preparations approaches this in selected cases. In some the bromides bring about a complete cessation of seizures, but in most instances there is but a diminution in the frequency and severity of the attacks. In other cases, as is well known, the bromides seem to exert no appreciable influence on the symptoms.

Bromism is not necessary to produce favorable results where such are to occur. Proper regard for diet, hygiene, especially hydrotherapy, and dosage will obviate untoward results.

Bromides should be given early and continued over a period of years. If a maximum continued dose of from 75 to 90 grains during the 24 hours does not control the seizures in an adult, it is not wise in the average case to push the drug beyond this point.

It is well established that the elimination of sodium chloride from the diet aids materially in producing the full effect of the bromides. The potassium, sodium and strontium salts are most commonly administered, ordinarily in divided doses and usually in combination in an elixir and

well diluted. Other bromine preparations; *e. g.*, bromipin, brovalol, bromoglidine, brometone, etc., may be used as more elegant medicaments. Where associated cardio-vascular conditions exist, digitalis, strophanthus, amyl. nitrate, nitroglycerine, etc., prove of value. Bechterew recommends adonis vernalis with bromides and Turner claims to have obtained good results following the use of Gelineau's formula; *i. e.*, Pot. brom., 1 grm.; picrotoxin, 1-3 mgrm., and $\frac{1}{2}$ mgrm. of the arseniate of antimony. Turner increases the dose until six such doses are taken daily. Belladonna, borax, chloretone, simulo, solanum carolinensis, zinc salts, etc., have never given me any good results.

Contrary to what is often taught, strychnine can be used without fear as a stimulant or tonic where indicated.

During the past year, investigators have claimed much benefit resulting from the giving of calcium lactate but a series of cases at Craig Colony to whom it was exhibited failed to show much change except one boy whose condition did improve some.

The treatment of serial seizures, status epilepticus and the various mental disorders accompanying epilepsy is of great importance. Avoidance of constipation, proper exercise, a carefully regulated diet and frequent bathing are of the utmost value as prophylactic measures. When status is once established, the gastro-intestinal tract must be thoroughly emptied by cleansing enemata and by stomach tube. Then chloral or amylene hydrate by enema should be used judiciously to control the convulsions. The bromides are of but little value in this condition.

Chloroform may be given in the early stage until some chloral has been absorbed. Lumbar puncture to relieve this supposed increased intracranial tension may be used in severe cases. Venesection is used in plethoric individuals. Cold sponges or packs are of great value to control the temperature which may be elevated to 107 or 108 degrees. For stimulation, where required, I have found enemata of strong black coffee and hypodermatic injections of brandy and aromatic spirits of ammonia to act very nicely.

After the convulsions have ceased, a supportive diet and careful nursing are all important. Watch out for pneumonia and bed sores.

For the mental disturbances close supervision, nourishing food, due attention to the emunctories and hydrotherapy are sufficient. Where insufficient nursing exists, it may be necessary in markedly maniacal cases to use hyoscine hydrobromate hypodermically, but only as a last resort. Continuous warm baths and hot packs properly given will quiet the most violent case.

The diet in epilepsy can be fairly liberal avoiding an excess of meats and all pastries, sweets, etc. Pork is usually tabooed but I cannot see how a little, if well cooked, cannot be allowed occasionally. Some patients do better without any meat. Cooked cabbage and cauliflower are to be avoided. The food must be well masticated, not bolted. Unless the little details in diet as well as hygiene, etc., are carefully attended to, we cannot look for beneficial results.

For chronic cases in which there is an organic basis, the individuals should be placed in the special institution where with his fellow sufferers he may lead as cheerful an existence as his con-

dition will permit. He can have regular and congenial occupation and recreation with a suitably arranged simple life with avoidance of all undue excitement. Where epileptoid symptoms are apparently due to abuse of alcohol, total abstinence must be insisted upon. Dietary and hygienic details must be given careful attention. Oftentimes in these cases there must be a radical change in the environment if a favorable outcome is to be looked for.

Epilepsy is essentially a chronic disorder, consequently treatment must be continued over a long period of years and in all instances a closely regulated mode of living must be maintained throughout the remainder of life. An individual who has once had symptoms of epilepsy and they have disappeared may have a recurrence owing to his pre-disposition.

A fact to be borne in mind is, that a sudden withdrawal of sedatives from an epileptic may produce a fatal status epilepticus. The use of sera, thyroid and other glandular extracts has not proved to be as valuable as was promised, although some writers still report marvelous results.

The use of quack remedies must be combatted as they usually tend to seriously injure the individual.

Altruistic principles make us feel that permanent segregation of defectives is a kindness to these unfortunates and a duty owing the social body at large. / Asexualization is indicated in many instances to prevent absolutely the propagation of these individuals, but if even these are turned loose in the community, they cannot

properly adjust themselves to their environment. The high grade defective, even though prevented from begetting his kind, is capable of doing much harm if allowed his freedom. All of these preventive measures cannot blot out the army of defectives as a considerable percentage are recruited from parents supposedly approaching the normal average, but it is clearly evident to all that those plainly defective should not be permitted to multiply their kind.

Those entering into the married state should do so with greater knowledge and circumspection than is now the case. The contracting parties should be aware of what will unfailingly follow certain conditions.

One writer of experience remarks that the time should soon come when all cases of epilepsy, feeble-mindedness, insanity, criminality, etc., should be reported to some central point and accurate records kept of such defectives.

Before any material results can be obtained from law restricting marriage or cohabitation, we must secure the active co-operation of the general public. In order that this may be brought about, it will be necessary to carry on for years or even generations an active campaign of education to create a well established public sentiment against the propagation of the unfit. This public education must come primarily through the efforts of the physician, especially the general practitioner. This subject is very old as you all know, but why not every time you can, do your share toward teaching what can be done? Physicians in general must begin to realize the seriousness of these matters and the

great necessity of exercising such means of prophylaxis as are readily available.

I have for your inspection a few charts prepared by Dr. Munson, which illustrate very clearly how many defectives propagate and why their marrying should be systematically discouraged.

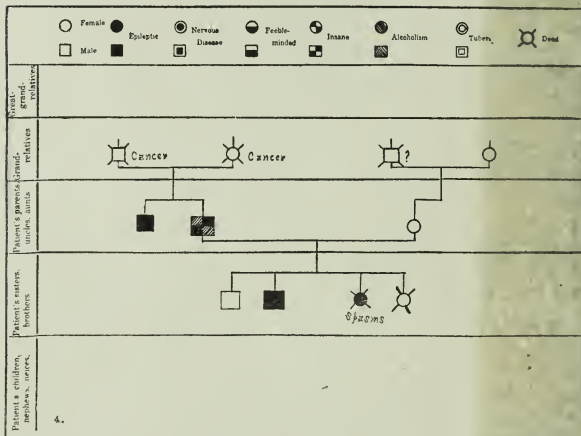
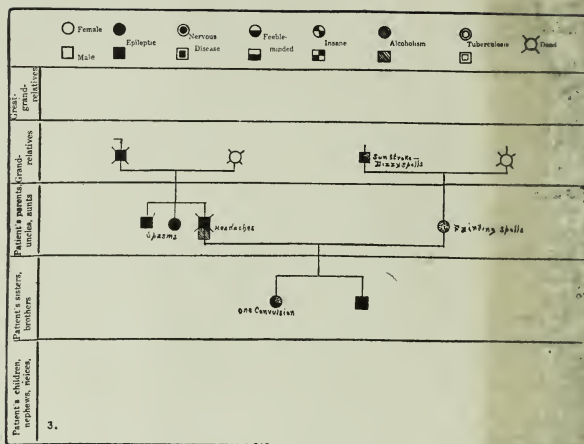
New York State should have laws with proper penalties attached, prohibiting the inter-marriage or cohabiting without marriage of those plainly defective such as the epileptic, feeble-minded, insane, confirmed criminal, inebriate, etc. These laws should also make it a serious offense for any person of sound mind to marry or cohabit with or to aid others in marrying or cohabiting with any such epileptic, insane, feeble-minded, criminal or otherwise mentally defective individual.

Why does not New York State come forward in this matter of prevention as well as it has in its active campaign against tuberculosis?

After considering the etiological factors and the course of epilepsy, one can readily understand why the ultimate prognosis is unfavorable in such a great percentage of cases. Many respond to proper treatment so far as a diminished frequency of seizures and general improvement of health is concerned, but those actually cured are comparatively speaking very few indeed.

The earlier the onset, the more frequent the seizures, the more marked the general deterioration, the worse is the prognosis.

The period that an epileptic must be free from seizures to be considered cured varies from two years to a lifetime according to the particular writer. In my opinion, if an epileptic has



been free from seizures for from two to four years, they can be pronounced as recovered with the explanation, however, that seizures may recur later in life.

Finally, we must confess that our prognosis does not differ materially from Cooke who stated nearly a century ago that: "Upon the whole, the younger the subject, the less frequent and less violent the attacks, the more removable the exciting cause and the shorter the time to which the patient has been subject to the disorder, the greater the probability of removal. On the contrary, when the disease is hereditary or of long standing and the attacks frequent and violent, when the strength is much diminished and the powers of the mind impaired, the more desperate must the state of the patient be considered."

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